

REMARKS

Applicants have amended claims 1, 7-9, 16, 29, and 30, and have cancelled claims 11 and 22-28 without prejudice. Applicants also have added new claims 71-74. Claims 1-10, 12-21, 29-40, and 66-74, of which claims 1, 29, and 30 are independent in form, are presented for examination.

Claim Rejections – 35 U.S.C. § 112

The Examiner has rejected claims 1-21, 29-40, and 66-70 under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. According to the Examiner, “[t]he omitted steps are: the inclusion of water to initiate the oxidation process.” (May 5, 2005 Office Action, page 2.) Applicants have cancelled claim 11. In the interest of expediting prosecution, Applicants have amended claims 1, 29, and 30 to recite methods that include combining a nickel hydroxide and a hydroxide salt in an inert atmosphere to form a dry mixture, and contacting the dry mixture with humidified ozone to form a nickel oxyhydroxide. Applicants therefore request that the rejection of claims 1-10, 12-21, 29-40, and 66-70 be withdrawn.

Claim Rejections – 35 U.S.C. § 102

The Examiner has rejected claims 1, 4-6, 8, 9, 13, 14, 16, 29, 30, 32-34, 36-38, and 66-70 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 3,911,094 (Megahed).

As amended, claims 1, 4-6, 8, 9, 13, 14, 16, 29, 30, 32-34, 36-38, and 66-70 recite methods that include combining a nickel hydroxide and a hydroxide salt in an inert atmosphere to form a dry mixture, and contacting the dry mixture with humidified ozone to form a nickel oxyhydroxide. But Megahed fails to anticipate claims 1, 4-6, 8, 9, 13, 14, 16, 29, 30, 32-34, 36-38, and 66-70, at least because Megahed does not disclose contacting a dry mixture with humidified ozone to form a nickel oxyhydroxide.

Megahed discloses a method for preparing nickel oxyhydroxide. (See, e.g., Megahed, col. 1, lines 4-7.) The method includes mixing a dry alkali metal hydroxide (e.g., potassium

hydroxide, sodium hydroxide, lithium hydroxide) with dry nickel hydrate ($\text{Ni}(\text{OH})_2$), and dry ozonating the resulting mixture to form nickel oxyhydroxide. (See id., col. 2, lines 26-50.)

Megahed explains that the mixture can be dry ozonated by, for example, transferring the mixture into a flask and rotating the flask by a small motor while passing ozone over the mixture in the rotating flask. (See id., col. 2, lines 63-68.) Megahed notes that,

The ozone oxidizes the nickel hydrate-metal hydroxide mixture into nickelic oxyhydroxide "nickelic oxide" as evidenced by the immediate change of the green $\text{Ni}(\text{OH})_2$ into black NiOOH " $\text{Ni}_2\text{O}_3 \cdot \text{H}_2\text{O}$ " according to this reaction:
 $\text{O}_3 + 2\text{Ni}(\text{OH})_2 \rightarrow 2\text{NiOOH} + \text{H}_2\text{O} + \text{O}_2$ (Id., col. 2, line 68 — col. 3, line 5.)

Megahed fails to disclose contacting a dry mixture with humidified ozone to form a nickel oxyhydroxide. As a result, Megahed does not anticipate claims 1, 4-6, 8, 9, 13, 14, 16, 29, 30, 32-34, 36-38, and 66-70, and Applicants request that the rejection of these claims be withdrawn.¹

Claim Rejections – 35 U.S.C. § 102 or § 103

The Examiner has rejected claims 2, 3, 10, 11, 35, 39, and 40 as anticipated by Megahed under 35 U.S.C. § 102(b) or, in the alternative, as obvious over Megahed under 35 U.S.C. § 103(a).

Applicants have cancelled claim 11. Claims 2, 3, 10, 35, 39, and 40 depend from claims 1, 29, and 30, and thus are not anticipated by Megahed, at least for the reasons provided above. Furthermore, a person of ordinary skill in the art would not have been motivated to modify Megahed to provide the methods recited by claims 2, 3, 10, 35, 39, and 40. Megahed explains that,

The nickel zinc couple has been the subject of extensive investigation and experimentation in the last several years. Recent work has indicated possible recharging of the system, and the proven long life capabilities of the nickel

¹ In his rejection of claims 1, 4-6, 8, 9, 13, 14, 16, 29, 30, 32-34, 36-38, and 66-70 as anticipated by Megahed under 35 U.S.C. § 102(b), the Examiner has stated that, "[w]ith respect to the claimed capacity loss of the battery, this feature has not been given patentable weight as it fails to further limit or give breadth and scope to the process claim." (May 5, 2005 Office Action, page 3.) Applicants do not concede that this is correct.

electrode combined with the high rate and energy density of the zinc electrode result in a practical high energy secondary battery. There has been, however, little commercial success in the area of primary nickel-zinc cells and the principal reason for this lack of success has been the instability of the nickel oxyhydroxide utilized as a cathodic material in such cells. (Megahed, col. 1, lines 14-25, emphasis added.)

However, Megahed's method apparently solves this problem since it results in "stable tetravalent nickel oxyhydroxide which tetravalent nickel oxyhydroxide is useful as a cathodic material in both primary and secondary batteries." (See id., col. 1, lines 57-61, emphasis added.) After reading these advantages of Megahed's method, a person of ordinary skill in the art would not have been motivated to modify Megahed's method, let alone to modify Megahed's method to provide the methods covered by claims 2, 3, 10, 11, 35, 39, and 40. Accordingly, Applicants request that the rejection of claims 2, 3, 10, 11, 35, 39, and 40 be withdrawn.

Claim Rejections – 35 U.S.C. § 103

The Examiner has rejected claims 7 and 17 under 35 U.S.C. § 103(a) as obvious over Megahed in view of U.S. Patent No. 4,481,128 (Jackovitz). Jackovitz discloses an active material "prepared by ozonation of an alkali metal cation containing aqueous slurry of hydrated Ni(II) hydroxide". (Jackovitz, col. 2, lines 63-67.) The operating temperature of the ozonation process "is usually about 20°C to about 25°C, but can be as high as about 50°C." (Id., col. 4, lines 35-36.) After ozonation, which results in "an Ni(III) hydroxide type material", Co(OH)₂ can be added to the Ni(III) hydroxide. (See id., col. 1, lines 48-59; col. 4, lines 37-45.) According to the Examiner, upon reading Jackovitz, a person of ordinary skill in the art would have been motivated to use cobalt oxyhydroxide, and/or an ozonation temperature of from 20°C to 50°C, in Megahed's method. (See May 5, 2005 Office Action, page 4.) But assuming without conceding that this is correct, the resulting method still would not have included all of the elements of claims 7 and 17 because, as explained above, Megahed's method does not include contacting a dry mixture with humidified ozone to form a nickel oxyhydroxide. Thus, Applicants request that the rejection of claims 7 and 17 be withdrawn.

The Examiner has rejected claim 17 under 35 U.S.C. § 103(a) as obvious over Megahed in view of U.S. Patent No. 5,759,718 (Yao). Yao discloses a cathode that includes cobalt oxyhydroxide. (Yao, col. 4, lines 45-51.) According to the Examiner, upon reading Yao, a person of ordinary skill in the art would have been motivated to use cobalt oxyhydroxide in Megahed's method. (See May 5, 2005 Office Action, pages 4-5.) But assuming without conceding that this is correct, the resulting method still would not have included all of the elements of claim 17 because, as explained above, Megahed's method does not include contacting a dry mixture with humidified ozone to form a nickel oxyhydroxide. Thus, Applicants request that the rejection of claim 17 be withdrawn.

The Examiner has rejected claim 12 under 35 U.S.C. § 103(a) as unpatentable over Megahed in view of U.S. Patent No. 5,800,947 (Köhler). Köhler discloses a Ni/Cd or Ni/hydride storage battery that has a cathode including spherical nickel hydroxide particles. (See, e.g., Köhler, Abstract.) According to the Examiner, upon reading Köhler, a person of ordinary skill in the art would have been motivated to use spherical nickel hydroxide particles in Megahed's method. (See May 5, 2005 Office Action, page 5.) But assuming without conceding that this is correct, the resulting method still would not have included all of the elements of claim 12 because, as explained above, Megahed's method does not include contacting a dry mixture with humidified ozone to form a nickel oxyhydroxide. Thus, Applicants request that the rejection of claim 12 be withdrawn.

The Examiner has rejected claims 15, 18, and 19 under 35 U.S.C. § 103(a) as unpatentable over Megahed in view of JP 2001-202956 ("Kodama").² Kodama discloses a battery electrode active material that includes a nickel hydroxide and a second component including one of a list of different metals, such as gold. (See, e.g., Kodama, ¶0007.) In some embodiments, the second component can be in the form of a hydroxide. (See, e.g., id., ¶0022.) According to the Examiner, upon reading Kodama, a person of ordinary skill in the art would have been motivated to use gold hydroxide (e.g., as an oxidation-promoting additive) in Megahed's method. (See May 5, 2005 Office Action, page 5.) But assuming without conceding

² Applicants submitted an English translation of JP 2001-202956 in an Information Disclosure Statement filed on February 10, 2005. Applicants refer to this English translation herein as "Kodama".

that this is correct, the resulting method still would not have included all of the elements of claims 15, 18, and 19 because, as explained above, Megahed's method does not include contacting a dry mixture with humidified ozone to form a nickel oxyhydroxide. Accordingly, Applicants request that the rejection of claims 15, 18, and 19 be reconsidered and withdrawn.

The Examiner has rejected claims 20, 21, and 31 under 35 U.S.C. § 103(a) as unpatentable over Megahed in view of U.S. Patent No. 5,700,596 (Ikoma). Ikoma discloses an electrode including a nickel oxyhydroxide active material, cobalt, and cobalt hydroxide. (See, e.g., Ikoma, col. 4, lines 4-13.) According to the Examiner, upon reading Ikoma, a person of ordinary skill in the art would have been motivated to use cobalt in Megahed's method. (See May 5, 2005 Office Action, page 6.) But assuming without conceding that this is correct, the resulting method still would not have included all of the elements of claims 20, 21, and 31 because, as explained above, Megahed's method does not include contacting a dry mixture with humidified ozone to form a nickel oxyhydroxide. Accordingly, Applicants request that the rejection of claims 20, 21, and 31 be reconsidered and withdrawn.

New Claims

Applicants have added new claims 71-74, which depend from claims 1, 29, or 30, and are patentable at least for the reasons discussed above.

At least for the reasons discussed above, Applicants believe that claims 1-10, 12-21, 29-40, and 66-74 are in condition for allowance, which action is requested.


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Page : 13 of 13

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Respectfully submitted,

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